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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/522,294	03/09/2000	Manabu Kato	35.C14341	3313

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EXAMINER

PHAM, HAI CHI

ART UNIT	PAPER NUMBER
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2861

DATE MAILED: 09/18/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/522,294

Applicant(s)

KATO, MANABU

Examiner

Hai C Pham

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 June 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 and 40-55 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-11 is/are allowed.
- 6) ☒ Claim(s) 12-18 and 40-55 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

FINAL REJECTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 12, 13, 18, 42, 43, 48, and 40-41/12, 40-41/13, 40-41/18, 40-41/42, 40-41/43, 40-41/48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato (U.S. 5,963,356) in view of Shiraishi (U.S. 4,878,066).

Kato discloses a scanning optical apparatus comprising a light source (1), a light deflector (5) for deflecting the light beam emitted from the light source, a scanning optical system (6) for focusing the light beam deflected by the light deflector on a surface to be scanned (photosensitive drum), a first detection optical element (42) for converging the light beam deflected by the light deflector, a second detection optical element (92) for focusing the detection light beam converged by the first detection optical element, a photodetector (9) for controlling a time of a start of scanning of the light beam by detecting the detection light beam, the first detection optical element having its optical surfaces arranged orthogonally relative to an arrangement direction of the detection light beam (Fig. 2). With regard to claim 42, Kato further teaches the detection optical element (42) having a refractive power in the main scanning direction

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(the refractive power in the main scanning direction of the lens 42 is different from its refractive power in the sub-scanning direction).

However, Kato fails to teach the light source having a plurality of light emitting sections.

Regardless, it is well known in the printing art that a light source having a plurality of light emitting sections is commonly used in the scanning optical device for forming a plurality of scanning lines at once on the surface to be scanned, which would increase the image forming speed, as evidenced by Shiraishi, whose multi-beam scanning apparatus includes a light source (laser emission device 6) having a plurality of light emitting sections (light emission units 2 and 4).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to incorporate a light source having a plurality of light emitting sections as taught by Shiraishi in the device of Kato. By doing so, the image forming speed would increase, wherein the implementation of such multi-beam light source would involve only routine skill in the art.

On the other hand, Kato fails to teach the plurality of image carriers. Nevertheless, a tandem type color image forming apparatus where a plurality of scanning optical devices such as taught by Kato are operated simultaneously to form a latent image on each of the corresponding image carriers or drums, is well known in the printing art., the configuration of which is within the routine skill in the art. Therefore, It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide a tandem type color image forming apparatus for the

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device of Kato, as modified by Shiraishi, for the purpose of realizing high-speed color image formation.

Kato further teaches the first detection optical element comprising an anamorphic lens, and the scanning optical apparatus including an incident optical system (lenses 2 and 41) for leading the light beam to the light deflector.

3. Claims 14, 44, and 40-41/14, 40-41/44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato in view of Shiraishi, as applied to claims 12 and 42 above, and further in view of Kanoto et al. (U.S. 5,365,259).

Kato, as modified by Shiraishi, discloses all the basic limitations of the claimed invention except for the detection optical element being made of a plastic material.

however, Kanoto et al. discloses a scanning optical device comprising a detection optical element (24c, Fig. 7) for converging the deflected laser beam toward the start of scan photosensor (11), the detection lens being disposed orthogonally relative to the deflected laser beam, and along with the integrally designed scanning lens (24) made of a plastic material.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Kato, as modified by Shiraishi, to have the detection lens made of plastic as taught by Kanoto et al. By doing so, it is possible to provide a light optical lens for converging and focusing the deflected light beams on the detecting area of the photodetector.

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4. Claims 15, 45, and 40-41/15, 40-41/45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato in view of Shiraishi, as applied to claims 12 and 42 above, and further in view of Kamikubo (U.S. 6,124,962).

Kato, as modified by Shiraishi, discloses all the basic limitations of the claimed invention except for the scanning optical system comprising a refraction optical element and a diffraction optical element.

However, Kamikubo discloses a scanning optical system whose scanning lenses comprise refraction lens elements with a diffraction lens structure for compensating compensates for the lateral chromatic aberration caused by the refraction lens elements.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the scanning device of Kato, as modified by Shiraishi, by incorporating the refraction and diffraction lens elements as taught by Kamikubo et al. Doing so would eliminate the chromatic aberration when a light source emitting a plurality of light beams of different wavelengths are used.

5. Claims 16, 17, 46, 47, and 40-41/16, 40-41/17, 40-41/46, 40-41/47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato, in view of Shiraishi and Kamikubo et al., as applied to claims 12, 15, 41, and 45 above, and further in view of Kanoto et al.

Kato, as modified by Shiraishi and Kamikubo et al., discloses all the basic limitations of the claimed invention except for the detection optical element and the scanning lens being integrally formed and being both made of a plastic material.

However, Kanoto et al. discloses a scanning optical device comprising a detection optical element (24c, Fig. 7) for converging the deflected laser beam toward the start of scan photosensor (11), the detection lens being disposed orthogonally relative to the deflected laser beam, and being integral to the scanning lens (24), both being made of a plastic material.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Kato, as modified by Shiraishi and Kamikubo et al., with the aforementioned teaching of Kanoto et al. By doing so, it is possible to provide a light and compact optical scanning device.

6. Claims 49, 50, 55, and 40-41/49, 40-41/50, 40-41/55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato in view of Suhara (U.S. 5,834,766).

Kato discloses all the basic limitations of the claimed invention except for the plurality of light emitting sections of the light source, and the photodetector and the center of the scanning width in the main scanning direction on the surface to be scanned being held optically equivalent.

However, it is well known in the printing art to use a light source having a multiple light emitting sections as well as to provide the photodetector for detecting a scan start timing to be normally optically equivalent to the surface to be scanned, as evidenced by

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Suhara, which discloses a multi-beam scanning optical device having a plurality of light emitting sections (11 and 12), and a photosensor (64) for detecting the deflected light beams to issue a scan start signal, the photosensor being held optically equivalent to the surface to be scanned (50). It is noted that the optical equivalent distance is commonly defined as the distance formed by a straight line from the facet of the deflecting element to the surface to be scanned, namely a line orthogonal to the scanned plane at the center of the scanning line width.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to incorporate a light source having a plurality of light emitting sections as taught by Suhara in the device of Kato. By doing so, the image forming speed would increase, wherein the implementation of such multi-beam light source would involve only routine skill in the art.

On the other hand, Kato fails to teach the plurality of image carriers. Nevertheless, a tandem type color image forming apparatus where a plurality of scanning optical devices such as taught by Kato are operated simultaneously to form a latent image on each of the corresponding image carriers or drums, is well known in the printing art., the configuration of which is within the routine skill in the art. Therefore, It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide a tandem type color image forming apparatus for the device of Kato, as modified by Suhara, for the purpose of realizing high-speed color image formation.

Kato further teaches the first detection optical element comprising an anamorphic lens, and the scanning optical apparatus including an incident optical system (lenses 2 and 41) for leading the light beam to the light deflector.

7. Claims 51, and 40-41/51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato in view of Suhara, as applied to claim 49 above, and further in view of Kanoto et al. (U.S. 5,365,259).

Kato, as modified by Suhara, discloses all the basic limitations of the claimed invention except for the detection optical element being made of a plastic material.

however, Kanoto et al. discloses a scanning optical device comprising a detection optical element (24c, Fig. 7) for converging the deflected laser beam toward the start of scan photosensor (11), the detection lens being disposed orthogonally relative to the deflected laser beam, and along with the integrally designed scanning lens (24) made of a plastic material.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Kato, as modified by Suhara, to have the detection lens made of plastic as taught by Kanoto et al. By doing so, it is possible to provide a light optical lens for converging and focusing the deflected light beams on the detecting area of the photodetector.

8. Claim 52, and 40-41/52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato in view of Suhara, as applied to claim 49 above, and further in view of Kamikubo (U.S. 6,124,962).

Kato, as modified by Suhara, discloses all the basic limitations of the claimed invention except for the scanning optical system comprising a refraction optical element and a diffraction optical element.

However, Kamikubo discloses a scanning optical system whose scanning lenses comprise refraction lens elements with a diffraction lens structure for compensating compensates for the lateral chromatic aberration caused by the refraction lens elements.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the scanning device of Kato, as modified by Suhara, by incorporating the refraction and diffraction lens elements as taught by Kamikubo et al. Doing so would eliminate the chromatic aberration when a light source emitting a plurality of light beams of different wavelengths are used.

9. Claims 53, 54, and 40-41/53, 40-41/54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kato, in view of Suhara and Kamikubo et al., as applied to claims 49 and 15 above, and further in view of Kanoto et al.

Kato, as modified by Suhara and Kamikubo et al., discloses all the basic limitations of the claimed invention except for the detection optical element and the scanning lens being integrally formed and being both made of a plastic material.

However, Kanoto et al. discloses a scanning optical device comprising a detection optical element (24c, Fig. 7) for converging the deflected laser beam toward the start of scan photosensor (11), the detection lens being disposed orthogonally relative to the deflected laser beam, and being integral to the scanning lens (24), both being made of a plastic material.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the device of Kato, as modified by Suhara and Kamikubo et al., with the aforementioned teaching of Kanoto et al. By doing so, it is possible to provide a light and compact optical scanning device.

Allowable Subject Matter

10. Claims 1-11 are allowed.

Response to Arguments

11. Applicant's arguments with respect to claims 12-18, and 40-55 have been considered, and are traversed in view of the new grounds of rejection presented in this Office action.

Conclusion

12. Applicant's amendment, which changes the scope of the base claim, necessitated the new grounds of rejection presented in this Office action. Accordingly,

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THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C Pham whose telephone number is (703) 308-1281. The examiner can normally be reached on T-F (8:30-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John S. Hilten can be reached on (703) 308-0719. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722, (703) 308-7724, (703) 308-7382, (703) 305-3431, (703) 305-3432 for regular communications and for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

A handwritten signature in cursive script, appearing to read 'HAI PHAM'.

HAI PHAM
PRIMARY EXAMINER
September 12, 2002